

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"7176175".pn.	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 13:53
L2	1	"7176175".pn. and mixing	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 13:59
L3	0	"7176175".pn. and dispersing	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 13:53
L4	1	"7176175".pn. and less	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:17
L5	18	"5767168".pn. or "5725780".pn. or "5723363".pn. or "5304707". pn. or "4397748".pn. or "4237004".pn. or "4131563".pn. or "5994423".pn. or "4645698". pn. or "4686776".pn. or "4500652".pn. or "4425463".pn. or "5639378".pn. or "4425461". pn. or "5789076".pn.	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:21
L6	10	I5 and (ammonia or (heavy metal) or amine)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:39
L7	34832	sulfonated and (ammonia or (heavy metal) or amine)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:39
L8	5311	sulfonated and acrylonitrile and (styrene or diene) and (ammonia or (heavy metal) or amine)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:49
L9	4	"5994423"	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:42
L10	2	I8 and (hydrolized polymer)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:43

EAST Search History

L11	53	l8 and (hydrolyzed polymer)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:50
L12	1275	sulfonated same acrylonitrile same (styrene or diene)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:50
L13	25	l12 and (hydrolyzed polymer)	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 14:58
L14	1	"6022928".pn.	US-PGPUB; USPAT; USOCR; EPO	ADJ	ON	2007/03/30 15:03
L15	1	"6022928"	DERWENT	ADJ	ON	2007/03/30 15:03

DERWENT-ACC-NO: 1998-065265

DERWENT-WEEK: 200680

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TITLE: High molecular weight polyelectrolyte
manufacture - by sulphonating waste poly:styrene resin,
optionally containing a halogenated fire retardant, in an
alicyclic solvent

INVENTOR: INAGAKI, Y; KUROMIYA, M ; NOGUCHI, T ; WATANABE, H ;
KUROMIYA, Y
; INAGAKI, S

PATENT-ASSIGNEE: SONY CORP[SONY] , INAGAKI Y[INAGI], KUROMIYA
M[KUROI],
NOGUCHI T[NOGUI], WATANABE H[WATAI]

PRIORITY-DATA: 1997JP-0001650 (January 8, 1997) , 1996JP-0177815
(July 8, 1996)
, 1996JP-0256982 (September 27, 1996) , 1996JP-0256984 (September 27,
1996)
, 1996JP-0262039 (October 2, 1996) , 1996JP-0262041 (October 2, 1996)
, 1997JP-0000372 (January 6, 1997) , 1998AU-0051081 (January 12,
1998)
, 2002AU-0034377 (April 17, 2002) , 2005AU-0237160 (November 25,
2005)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
PAGES MAIN-IPC		
KR 533306 B	December 5, 2005	N/A
000 C08F 008/36		
EP 818474 A2	January 14, 1998	E
040 C08F 008/36		
JP 10017616 A	January 20, 1998	N/A
006 C08F 008/36		
JP 10101725 A	April 21, 1998	N/A
006 C08F 006/06		
JP 10101731 A	April 21, 1998	N/A
011 C08F 008/36		
JP 10101733 A	April 21, 1998	N/A
010 C08F 008/36		
JP 10101873 A	April 21, 1998	N/A
010 C08L 025/18		

JP 10195134 A	July 28, 1998	N/A
006 C08F 008/36		
JP 10195234 A	July 28, 1998	N/A
005 C08J 011/18		
KR 98009295 A	April 30, 1998	N/A
000 C08F 008/36		
AU 9851081 A	July 29, 1999	N/A
000 C08F 008/36		
US <u>6022928</u> A	February 8, 2000	N/A
000 C08F 236/10		
US 6210581 B1	April 3, 2001	N/A
000 B01D 003/00		
US 6274681 B1	August 14, 2001	N/A
000 C08F 008/36		
US 20020016419 A1	February 7, 2002	N/A
000 C08F 008/34		
JP 3271238 B2	April 2, 2002	N/A
006 C08F 008/36		
JP 3289615 B2	June 10, 2002	N/A
010 C08F 008/36		
CN 1341668 A	March 27, 2002	N/A
000 C08F 008/36		
AU 200234377 A	June 20, 2002	N/A
000 C08F 008/36		
US 6417288 B2	July 9, 2002	N/A
000 C08F 008/36		
AU 752379 B	September 19, 2002	N/A
000 C08F 008/36		
JP 3371320 B2	January 27, 2003	N/A
006 C08F 008/36		
JP 3371322 B2	January 27, 2003	N/A
011 C08F 008/36		
JP 3371323 B2	January 27, 2003	N/A
006 C08F 006/06		
US 6545070 B1	April 8, 2003	N/A
000 C08K 005/15		
CN 1178221 A	April 8, 1998	N/A
000 C08F 008/36		
JP 3446513 B2	September 16, 2003	N/A
004 C08J 011/18		
JP 3470516 B2	November 25, 2003	N/A
010 C08L 025/18		
US 20040054093 A1	March 18, 2004	N/A
000 C08F 236/10		
CN 1490348 A	April 21, 2004	N/A
000 C08J 011/26		
EP 818474 B1	January 12, 2005	E
000 C08F 008/36		
CN 1542023 A	November 3, 2004	N/A
000		

CN 1542029 A 000	November 3, 2004	N/A
DE 69732199 E 000	February 17, 2005	N/A
AU 782770 B2 000	August 25, 2005	N/A
DE 69732199 T2 000	December 22, 2005	N/A
CN 1155625 C 000	June 30, 2004	N/A
CN 1150221 C 000	May 19, 2004	N/A
AU 2005237160 A1 000	December 22, 2005	N/A
CN 1249099 C 000	April 5, 2006	N/A

DESIGNATED-STATES: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT
SE DE FR
GB

APPLICATION-DATA:

PUB-NO APPL-DATE	APPL-DESCRIPTOR	APPL-NO
KR 533306B July 8, 1997	Div ex	1997KR-0031469
KR 533306B January 21, 2005	N/A	2005KR-0005776
EP 818474A2 July 4, 1997	N/A	1997EP-0111328
JP 10017616A July 8, 1996	N/A	1996JP-0177815
JP 10101725A October 2, 1996	N/A	1996JP-0262039
JP 10101731A September 27, 1996	N/A	1996JP-0256982
JP 10101733A September 27, 1996	N/A	1996JP-0256984
JP 10101873A October 2, 1996	N/A	1996JP-0262041
JP 10195134A January 8, 1997	N/A	1997JP-0001650
JP 10195234A January 6, 1997	N/A	1997JP-0000372
KR 98009295A July 8, 1997	N/A	1997KR-0031469
AU 9851081A January 12, 1998	N/A	1998AU-0051081
US 6022928A	N/A	1997US-0889011

July 7, 1997		
US 6210581B1	Div ex	1997US-0889011
July 7, 1997		
US 6210581B1	N/A	1999US-0383009
August 25, 1999		
US 6274681B1	Div ex	1997US-0889011
July 7, 1997		
US 6274681B1	N/A	1999US-0382944
August 25, 1999		
US 6274681B1	Div ex	US <u>6022928</u>
N/A		
US20020016419A1	Div ex	1997US-0889011
July 7, 1997		
US20020016419A1	N/A	1999US-0382914
August 25, 1999		
US20020016419A1	Div ex	US <u>6022928</u>
N/A		
JP 3271238B2	N/A	1997JP-0001650
January 8, 1997		
JP 3271238B2	Previous Publ.	JP 10195134
N/A		
JP 3289615B2	N/A	1996JP-0256984
September 27, 1996		
JP 3289615B2	Previous Publ.	JP 10101733
N/A		
CN 1341668A	Div ex	1997CN-0117442
July 8, 1997		
CN 1341668A	N/A	2001CN-0132812
July 8, 1997		
AU 200234377A	Div ex	1998AU-0051081
January 12, 1998		
AU 200234377A	N/A	2002AU-0034377
April 17, 2002		
US 6417288B2	Div ex	1997US-0889011
July 7, 1997		
US 6417288B2	N/A	1999US-0382914
August 25, 1999		
US 6417288B2	Div ex	US <u>6022928</u>
N/A		
AU 752379B	N/A	1998AU-0051081
January 12, 1998		
AU 752379B	Previous Publ.	AU 9851081
N/A		
JP 3371320B2	N/A	1996JP-0177815
July 8, 1996		
JP 3371320B2	Previous Publ.	JP 10017616
N/A		
JP 3371322B2	N/A	1996JP-0256982
September 27, 1996		
JP 3371322B2	Previous Publ.	JP 10101731

N/A		
JP 3371323B2	N/A	1996JP-0262039
October 2, 1996		
JP 3371323B2	Previous Publ.	JP 10101725
N/A		
US 6545070B1	Div ex	1997US-0889011
July 7, 1997		
US 6545070B1	N/A	1999US-0382949
August 25, 1999		
US 6545070B1	Div ex	US <u>6022928</u>
N/A		
CN 1178221A	N/A	1997CN-0117442
July 8, 1997		
JP 3446513B2	N/A	1997JP-0000372
January 6, 1997		
JP 3446513B2	Previous Publ.	JP 10195234
N/A		
JP 3470516B2	N/A	1996JP-0262041
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JP 3470516B2	Previous Publ.	JP 10101873
N/A		
US20040054093A1	Div ex	1997US-0889011
July 7, 1997		
US20040054093A1	Cont of	1999US-0382948
August 25, 1999		
US20040054093A1	N/A	2003US-0661111
September 12, 2003		
US20040054093A1	Div ex	US <u>6022928</u>
N/A		
CN 1490348A	Div ex	1997CN-0132812
July 8, 1997		
CN 1490348A	N/A	2003CN-0155047
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EP 818474B1	N/A	1997EP-0111328
July 4, 1997		
EP 818474B1	Related to	2004EP-0013724
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EP 818474B1	Related to	EP 1457503
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EP 818474B1	Related to	EP 1457504
N/A		
CN 1542023A	Div ex	2001CN-0132812
July 8, 1997		
CN 1542023A	N/A	2004CN-A038669
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CN 1542029A	Div ex	2001CN-0132812
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CN 1542029A	N/A	2004CN-A038668

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DE 69732199E	N/A	1997DE-0632199
July 4, 1997		
DE 69732199E	N/A	1997EP-0111328
July 4, 1997		
DE 69732199E	Based on	EP 818474
N/A		
AU 782770B2	Div ex	1998AU-0051081
January 12, 1998		
AU 782770B2	N/A	2002AU-0034377
April 17, 2002		
AU 782770B2	Previous Publ.	AU 200234377
N/A		
DE 69732199T2	N/A	1997DE-0632199
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DE 69732199T2	N/A	1997EP-0111328
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DE 69732199T2	Based on	EP 818474
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CN 1155625C	N/A	2001CN-0132812
July 8, 1997		
CN 1150221C	N/A	1997CN-0117442
July 8, 1997		
AU2005237160A1	N/A	2005AU-0237160
November 25, 2005		
AU2005237160A1	Div ex	AU 782770
N/A		
CN 1249099C	N/A	2004CN-A038669
July 8, 1997		

3271238 B2 , JP 3289615 B2

INT-CL (IPC): B01D003/00, B01D021/01 , B09B003/00 , C08F006/06 ,
 C08F008/00 , C08F008/24 , C08F008/30 , C08F008/32 , C08F008/34 ,
 C08F008/36 , C08F008/38 , C08F008/44 , C08F012/00 , C08F012/06 ,
 C08F012/08 , C08F112/08 , C08F212/08 , C08F212/34 , C08F236/04 ,
 C08F236/10 , C08J007/14 , C08J011/02 , C08J011/18 , C08J011/26 ,
 C08J011/28 , C08K003/00 , C08K003/04 , C08K003/32 , C08K005/00 ,
 C08K005/07 , C08K005/13 , C08K005/15 , C08K005/3432 , C08L025/06 ,
 C08L025/10 , C08L025/18 , H01B001/06

RELATED-ACC-NO: 2004-679608, 2004-758859 , 2005-144720

ABSTRACTED-PUB-NO: EP 818474A

BASIC-ABSTRACT:

A method of manufacturing a poly-electrolyte comprises sulphonating a polystyrene resin, which is dissolved or dispersed in a solvent

comprising an alicyclic compound. Also claimed are: (1) a method of sulphonating aromatic polymers; and (2) a method of disposing of plastic containing halogen flame retardant.

USE - To recycle wasted plastics, e.g. foamed styrene polymers, which may contain halogenated fire retardants. Polyelectrolytes based on styrene/conjugated diene copolymers containing ionic groups are used as a polymer coagulant for disposing of waste water (claimed), and also as a cement additive, a dispersant for inorganic pigments, a conductive agent for an electronic copying machine, an anti-static agent, a scale-preventive agent, a dispersant for emulsion polymerisation and an aqueous glue. Resins of molecular weight 600,000 or higher may be used as a coagulant, an absorbing resin, an ion exchange resin, a chelate resin, a paper strength enhancer, a surface sizing agent for paper or a superplasticiser for coal slurry.

ADVANTAGE - A halogen-free polyelectrolyte is generated from waste polymer without producing large amounts of toxic waste materials. The polyelectrolytes have higher molecular weights, (produced by crosslinking), they may be recovered in a water-free state and water need not be added to the reaction system, and the solvent is recycled. Separation of halogenated fire retardants is efficient as they are not sulphonated and remain in organic solution while the water-soluble polymers may be extracted and separated quickly into an aqueous solvent. Gel formation during sulphonation is prevented when the polystyrene contains rigid conjugated diene units, which prevent sulphone crosslinking. The presence of a radical-scavenging inorganic pigment prevents crosslinking via conjugated diene units. When an alicyclic unsaturated hydrocarbon is present during sulphonation, it is sulphonated to form a

surfactant, which improves the ease of dispersion of the product slurry.

CHOSEN-DRAWING: Dwg.0/3

TITLE-TERMS: HIGH MOLECULAR WEIGHT POLYELECTROLYTE MANUFACTURE
SULPHONATED

WASTE POLY STYRENE RESIN OPTION CONTAIN HALOGENATED FIRE
RETARD
ALICYCLIC SOLVENT

DERWENT-CLASS: A13 A35 A91 D15 F09 G02 G03 G08 H09 L02 P43 S06 X12
X25

CPI-CODES: A04-C02D; A08-F01; A08-S02; A10-E12A; A11-C03; A11-C07;
A12-M02;
D04-A01B; F05-A06B; F05-A06C; G02-A05C; H09-F02; L02-C08;

EPI-CODES: S06-A01X; X12-D01C; X25-S;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 0424U; 0913U ; 1514U ; 1675U

ENHANCED-POLYMER-INDEXING:

Polymer Index [1.1]

018 ; R00708 G0102 G0022 D01 D02 D12 D10 D19 D18 D31 D51 D53 D58
D76 D88 ; L9999 L2391 ; L9999 L2799 ; M9999 M2799 ; S9999 S1014*R
; S9999 S1627 S1605 ; S9999 S1309*R ; L9999 L2391 ; L9999 L2073
; M9999 M2073 ; M9999 M2460 ; M9999 M2415 ; M9999 M2700 ; A999
A782
; A999 A624*R A566 ; A999 A646 A624 A566 ; A999 A635 A624 A566 ;
H0000 ; H0011*R ; P1741 ; P1752

Polymer Index [1.2]

018 ; ND01 ; ND07 ; ND03 ; Q9999 Q8764 ; N9999 N6906 ; N9999
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; N9999 N5889*R ; N9999 N5947 ; Q9999 Q9110 ; Q9999 Q6951*R Q6939
; Q9999 Q8753 ; N9999 N6575 ; Q9999 Q7001 Q6995 ; Q9999 Q8617*R
Q8606 ; B9999 B3269 B3190 ; B9999 B3305 B3292 B3190 ; Q9999 Q6962
Q6951 Q6939 ; Q9999 Q6644*R ; B9999 B5094 B4977 B4740 ; Q9999
Q9370
; Q9999 Q7772 ; Q9999 Q7114*R ; Q9999 Q7216 Q7114 ; Q9999 Q8093*R
; K9563 K9483 ; K9676*R ; K9483*R ; K9712 K9676 ; B9999 B3521*R
B3510 B3372 ; N9999 N6928 ; N9999 N5890 N5889 ; N9999 N6780*R
N6655
; N9999 N6860 N6655 ; N9999 N6735*R N6655 ; N9999 N6177*R ; B9999
B4535 ; B9999 B3690*R

Polymer Index [1.3]

018 ; S* 6A P* 5A C1 7A ; H0157

Polymer Index [1.4]

018 ; 7A*R Br 7A ; A999 A248*R ; N9999 N7283 ; K9950

Polymer Index [1.5]

018 ; D01 D13*R D02 ; R00913 D01 D02 D14 D13 D31 D50 D76 D86 ;
D01
D13*R D14 D13 D11 D10 D12 D31 D76 D54 D51 D57 D58 D59 D90 D02 ;
D01 D10*R D69 7A*R ; N* 5A O* 6A ; A999 A475
Polymer Index [1.6]
018 ; D01 D11 D10 D50 D63 D60 D89 F27 F26 F37 F35 F89 F41 ; D01
D11 D10 D23 D22 D31 D75 D42 D53 D51 D59 D86 F29 F26 F43 Na 1A
D61*R
O* 6A ; R00035 D01 D11 D10 D23 D22 D31 D42 D51 D53 D59 D63 D75
D86
F29 F26 F43 ; D01 D18*R F30*R ; P* 5A S* 6A ; A999 A486*R ; A999
A497 A486
Polymer Index [1.7]
018 ; D01 D18*R D19 D18 D76 F30*R ; D01 D19 D18 D76 F23 ; G2540*R
D01 D22 D45 D77 F11 N* 5A ; D01 F07*R ; D01 D26 D11 D10 D51*R D58
F12 O* 6A ; D01 D19 D18 D76 F30*R O* 6A ; E10 E00 D01 D19 D18 D32
D76 D50 D93 O* 6A N* 5A ; A999 A486*R ; A999 A544 A486
Polymer Index [2.1]
018 ; R00708 G0102 G0022 D01 D02 D12 D10 D19 D18 D31 D51 D53 D58
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M9999 M2799 ; S9999 S1014*R ; S9999 S1627 S1605 ; S9999 S1309*R
; L9999 L2391 ; L9999 L2073 ; M9999 M2073 ; M9999 M2460 ; M9999
M2415 ; M9999 M2700 ; A999 A782 ; A999 A624*R A566 ; A999 A646
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A566 ; A999 A635 A624 A566 ; H0022 H0011 ; H0033 H0011 ; P1741
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B4535 ; B9999 B3690*R
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018 ; S* 6A P* 5A C1 7A ; H0157
Polymer Index [2.4]
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Polymer Index [2.5]
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; A999 A180
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D01 D10*R D69 7A*R ; N* 5A O* 6A ; A999 A475
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 O* 6A ; R00035 D01 D11 D10 D23 D22 D31 D42 D51 D53 D59 D63 D75
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 A497 A486
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 F12 O* 6A ; D01 D19 D18 D76 F30*R O* 6A ; E10 E00 D01 D19 D18 D32
 D76 D50 D93 O* 6A N* 5A ; A999 A486*R ; A999 A544 A486
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 ; A999 A624*R A566 ; A999 A646 A624 A566 ; A999 A635 A624 A566 ;
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 P1752
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 018 ; D00 D65 H* O* 6A S* ; H0226
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 Polymer Index [3.6]
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 D01 D10*R D69 7A*R ; N* 5A O* 6A ; A999 A475

Polymer Index [3.8]

018 ; D01 D18*R F30*R ; P* 5A S* 6A ; D01 D11 D10 D23 D22 D31 D75
D42 D53 D51 D59 D86 F29 F26 F43 Na 1A D61*R O* 6A ; R00035 D01

D11

D10 D23 D22 D31 D42 D51 D53 D59 D63 D75 D86 F29 F26 F43 ; D01 D11
D10 D50 D63 D60 D89 F27 F26 F37 F35 F89 F41 ; A999 A486*R ; A999
A497 A486

Polymer Index [3.9]

018 ; D01 D18*R D19 D18 D76 F30*R ; D01 D19 D18 D76 F23 ; G2540*R
D01 D22 D45 D77 F11 N* 5A ; D01 F07*R ; D01 D26 D11 D10 D51*R D58
F12 O* 6A ; D01 D19 D18 D76 F30*R O* 6A ; E10 E00 D01 D19 D18 D32
D76 D50 D93 O* 6A N* 5A ; A999 A486*R ; A999 A544 A486

Polymer Index [4.1]

018 ; P0000 ; L9999 L2506*R ; L9999 L2551 L2506

Polymer Index [4.2]

018 ; ND00 ; ND03 ; ND07

Polymer Index [4.3]

018 ; A999 A624*R A566 ; A999 A635 A624 A566 ; A999 A646 A624
A566
; A999 A759

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1998-022723

Non-CPI Secondary Accession Numbers: N1998-051320